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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,772	03/06/2002	Xin Jin	555255012315	6853

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EXAMINER	
GHULAMALI, QUTBUDDIN	
ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,772	JIN ET AL.	
	Examiner	Art Unit	
	Qutub Ghulamali	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation "the first four" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1 rejected under 35 U.S.C. 102(e) as being anticipated by Dabak et al (US Patent 6,775,260).

Regarding claim 1, Dabak discloses a method of obtaining a frequency error estimate of the difference between a reference frequency and the frequency of a space time transmit diversity

signal (fig. 1, elements 102, 100, 104, 106, 108), from first and second received sequences of symbols, transmitted respectively by first and second antennae (ANT 1, ANT 2), where each sequence has two sets of first and second intervals, such that the contents of the second interval of the second received sequence are the additive inverse of the contents of the first interval of the second received sequence comprising:

receiving the first and second sequences of symbols (figs. 1, 5A) (col. 3, lines 52-67; col. 4, lines 5-10);

calculating two sets of first and second partial sums as the sum of the contents of the first and second intervals, respectively, for each set (col. 5, lines 15-20);

calculating total sum functions for the first and second sets by summing the first and second partial sums for each set (col. 5, lines 20-40);

calculating a correlation function based cm the total sum functions for the first and second sets (col. 5, lines 62-67; col. 6, lines 1-9, 46-54); and

extracting the frequency error estimate from the correlation function (col. 7, lines 45-56; col. 8, lines 16-22).

Regarding claim 2, Dabak discloses the correlation function is calculated as a time average of the product of the first total sum function and the conjugate of the second total sum function (col. 6, lines 10-19, 41-67).

Regarding claim 3, Dabak discloses the received symbols are represented by complex numbers (col. 6, lines 41-46).

Regarding claim 4, Dabak discloses extracting includes isolating the imaginary part of the correlation function as the frequency error estimate (col. 7, lines 45-56).

Regarding claim 5, Dabak (602) discloses the first and second interval in each set is adjacent (fig. 1, elements T, 2T).

Regarding claim 6, Dabak discloses the first and second sets of intervals are interleaved (rearranged) with each other (col. 5, lines 16-26).

Regarding claims 7-9, Dabak discloses contents of the first and second intervals in each set form a complete symbol (col. 5, lines 17-32).

Regarding claim 10, Dabak discloses adding the correlation to a correlation of a second set of total sum functions calculated by summing the first partial sum with the additive inverse of the second partial sum (col. 7, lines 45-67).

Regarding claim 11, Dabak discloses multiplying the frequency error estimate by the average of a signal-to-noise-ratio of the received sequences (fig. 2; col. 4, lines 23-52).

Regarding claim 12, Dabak discloses altering the reference frequency based on the frequency error estimate to minimize the difference between the reference frequency and the frequency of the space time transmit diversity signal (col. 8, lines 15-25).

Regarding claim 13, Dabak discloses carrying out all of the steps parallel to provide a multitude of diverse correlation functions (see claim 1 above); and

combining the multitude of diverse correlation functions to provide the correlation function before extracting the frequency error from the correlation function (see claim 1 above).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 14-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dabak et al (US Patent 6,775,260).

Regarding claim 14-31, the steps claimed as apparatus is nothing more than restating the function of the specific components of the apparatus as claimed above and therefore, it would have been obvious, considering the aforementioned rejection for the method claims in 1.

5. Claims 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dabak et al (US Patent 6,775,260) in view of Krasner (US Pub. 2002/0084933).

With reference to claim 32, Dabak discloses all of the claimed limitations. Dabak however, fails to disclose a loop filter and a controlled oscillator operatively coupled to the loop filter. Krasner in a similar field of endeavor discloses (fig. 9) a loop filter, operatively attached to the frequency discriminator (550)to receive the frequency error, for generating an oscillator control signal based on the frequency error to minimize the difference between the reference frequency (542) and the frequency of the space time transmit diversity signal (col. 5, section 0072); and

a controlled oscillator, operatively attached to the loop filter to receive the oscillator control signal, for generating the reference frequency based on the oscillator control signal (col. 5, section 0072). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a closed loop tracking to correct frequency error as taught by Krasner in the circuit of Dabak because it can mitigate the error between the received signal and the reference and the loop than provides a correction signal to compensate for the error.

Regarding claims 33 and 34, the use of numerically controlled or a voltage controlled oscillator, is designed based and their availability and use are well known in the art and therefore, its use is obvious to a person of ordinary skill in the art.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patents:

Nafie et al (US Pub 2005/0058216) discloses a block level space time transmit diversity wireless communications system.

Dabak et al (USP 6728302) shows a STTD encoding of signals from a multiple antennas.

Kuchi et al (USP 6748024) discloses a method and apparatus for phase hopping and space time coding of signals.

Partyka et al (USP 5241562) discloses a spread spectrum communication system for reducing the frequency errors.

Brown et al (USP 6650694) shows a correlator coprocessor for CDMA RAKE receiver operations.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday from 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QG.
June 23, 2005.

JAY K. PATEL
SUPERVISORY PATENT EXAMINER